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US 4506914 A

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(54) Security seals with heat distortable portions to indicate tampering

(57) A security seal includes a body portion formed of plastics material which is deformable into engagement with an elongate member e.g. wire 8, and tamper-indicating portions 4, 5, 6, each of which has dimensions such that it distorts or melts in preference to the body portion when heat is applied in an attempt to disengage the seal from, or to re-engage the seal with, the member. A logo or other letters or numerals 9 may be embossed while crimping the body or formed on a tamper-indicating portion 4. The member 8 may be integrally formed with the body.

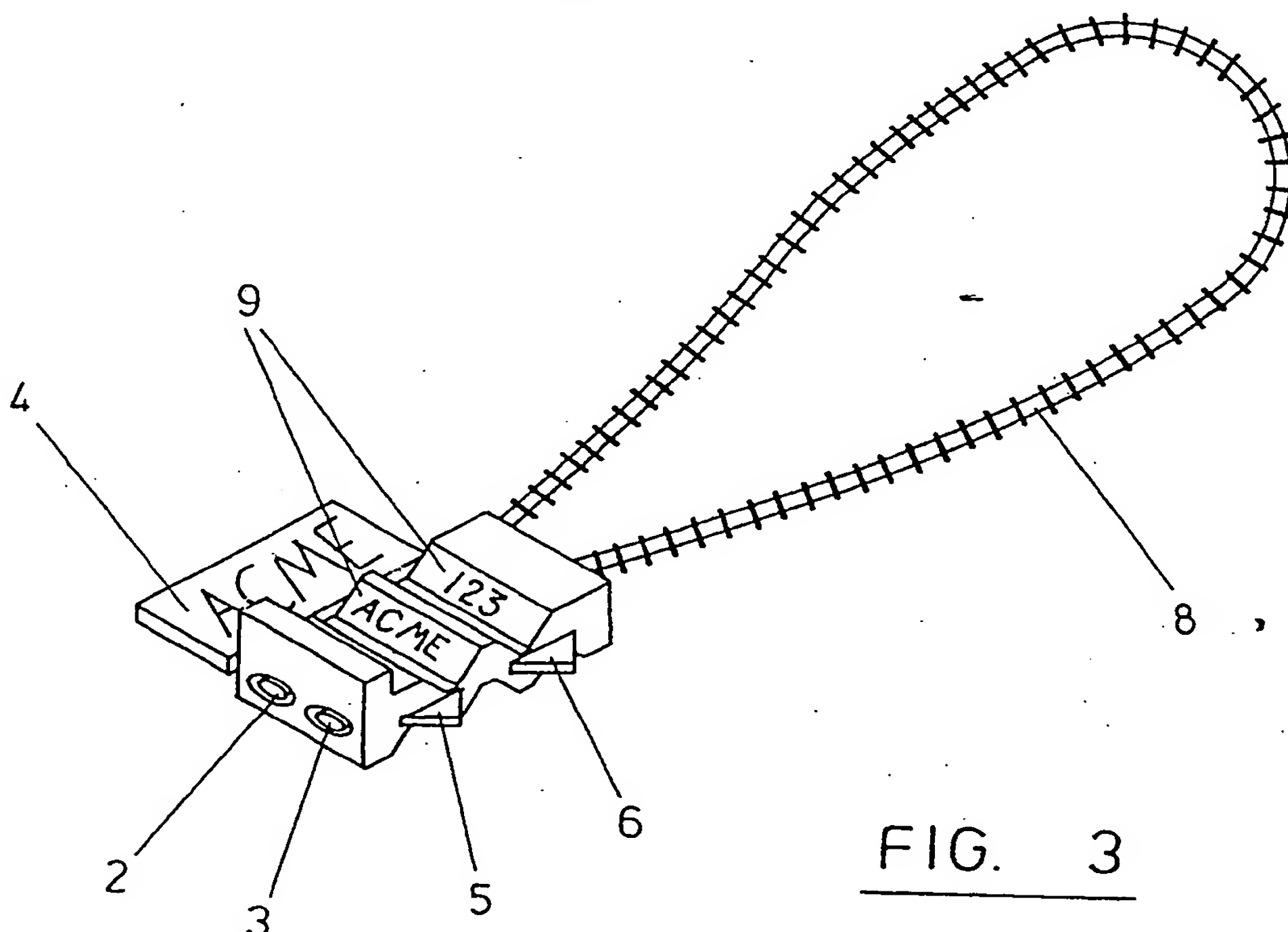


FIG. 3

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

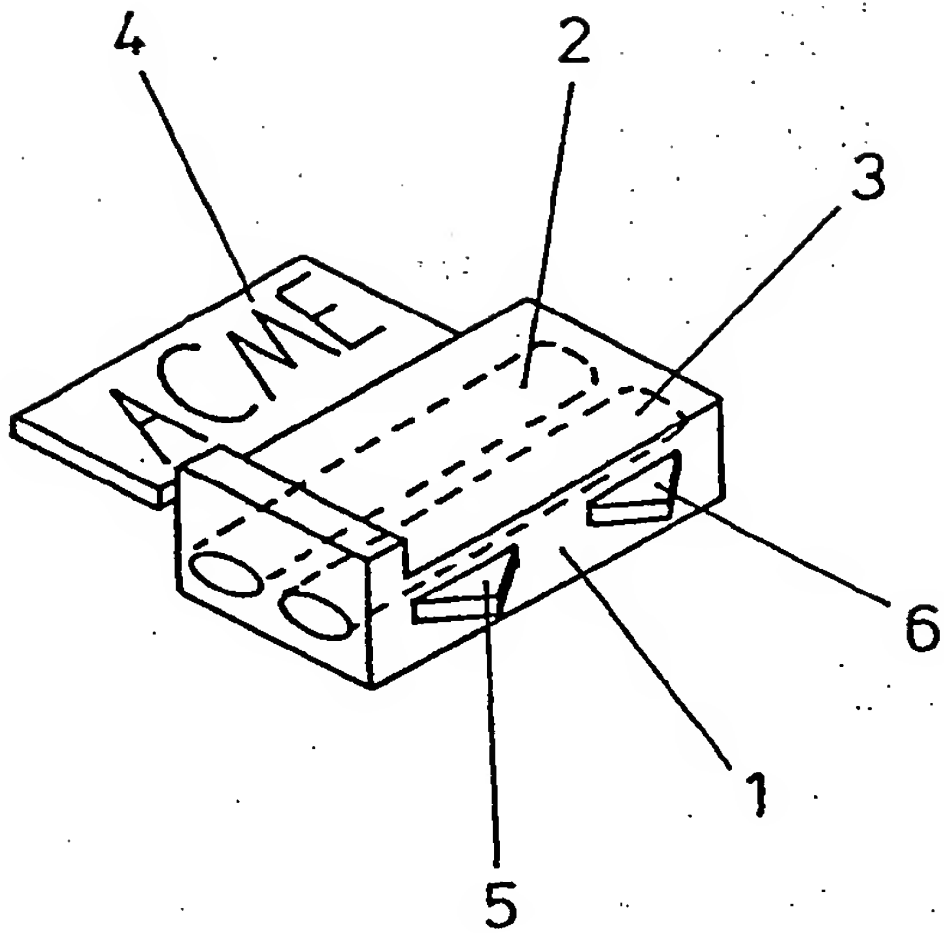


FIG. 1a

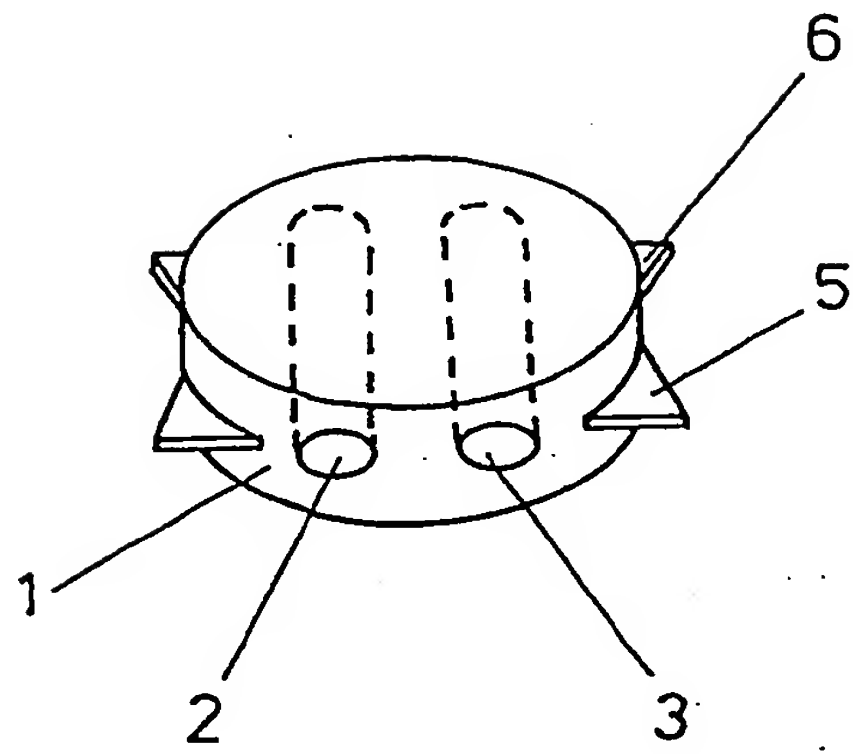


FIG. 1b

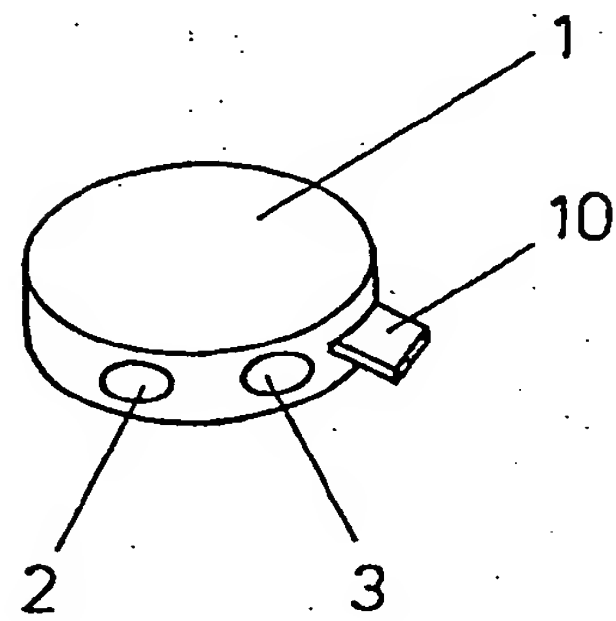


FIG. 1c

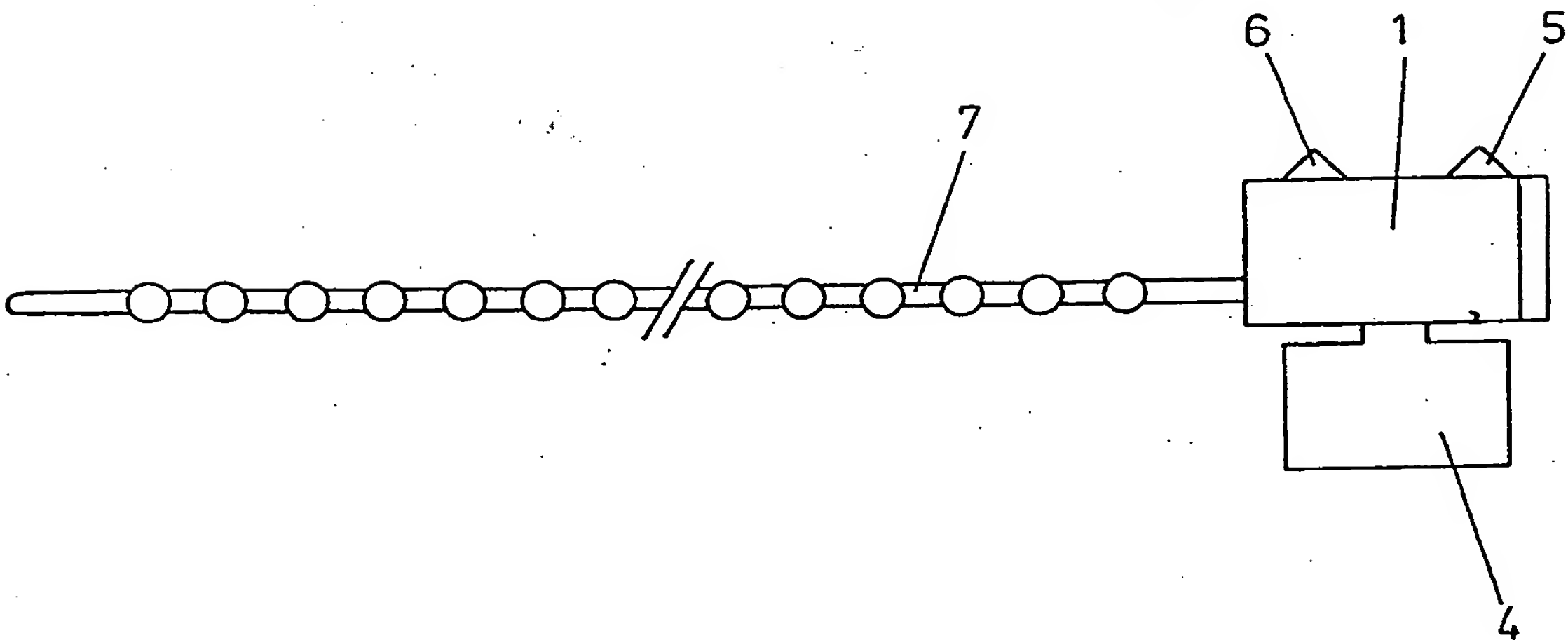
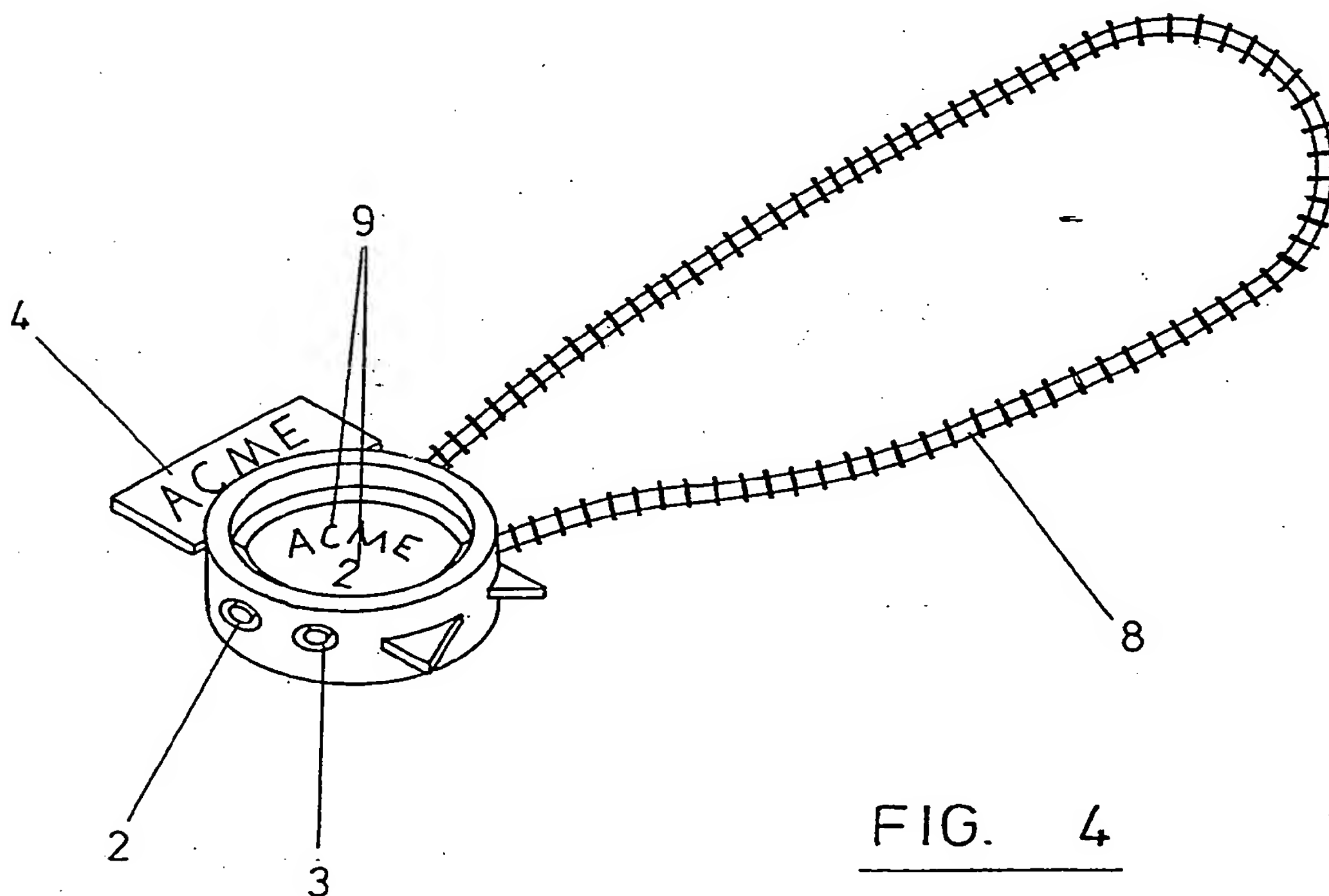
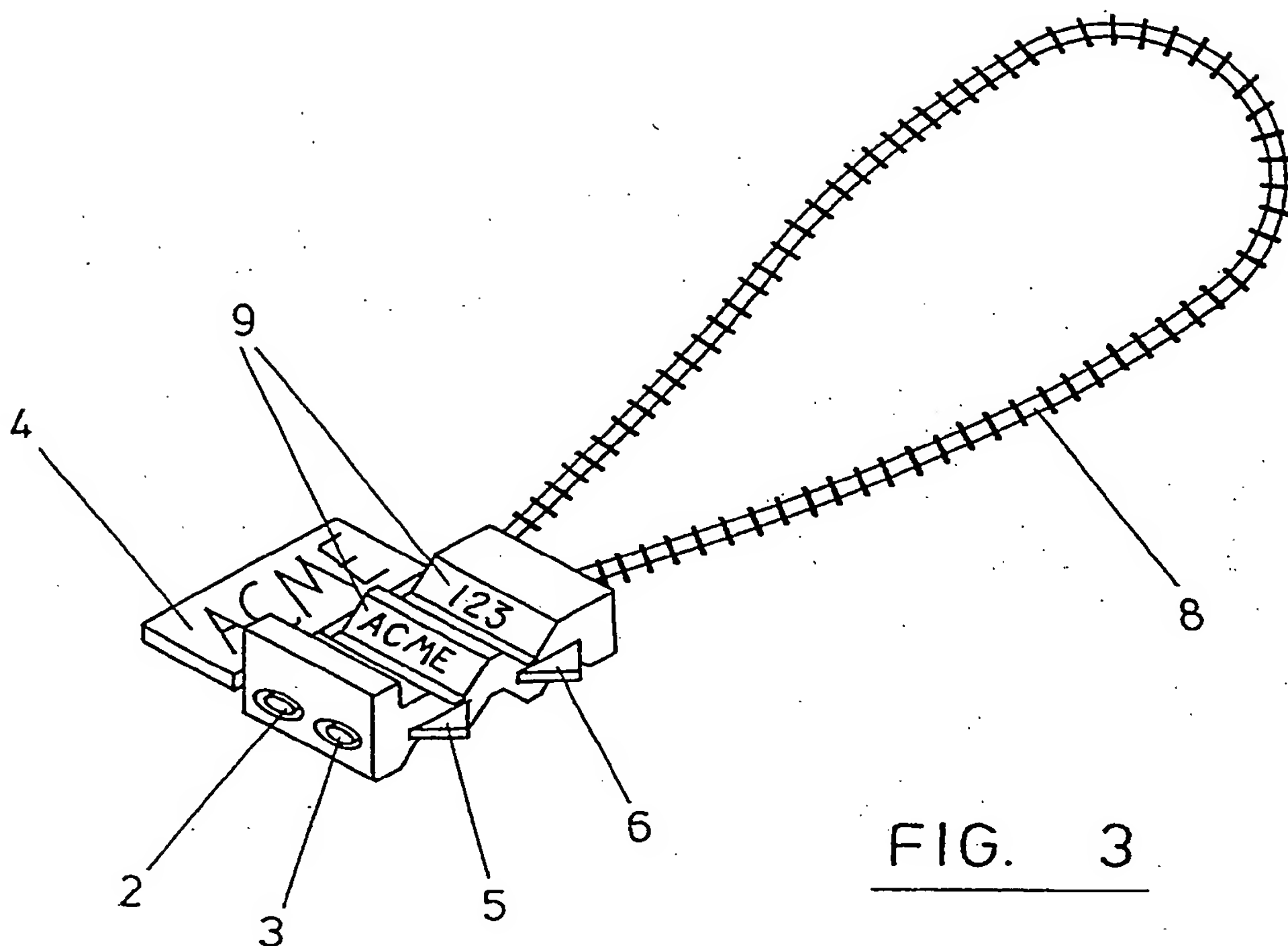
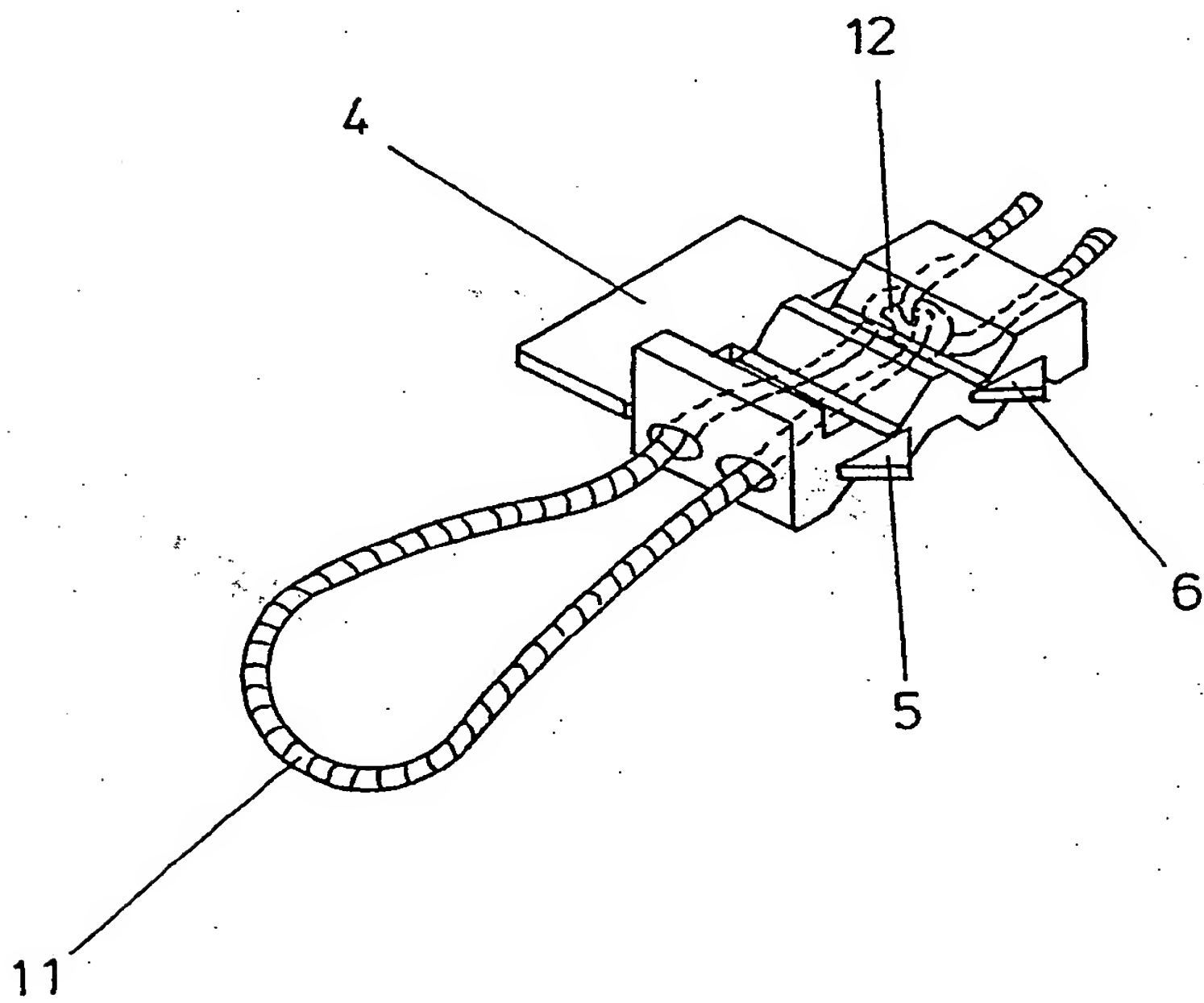
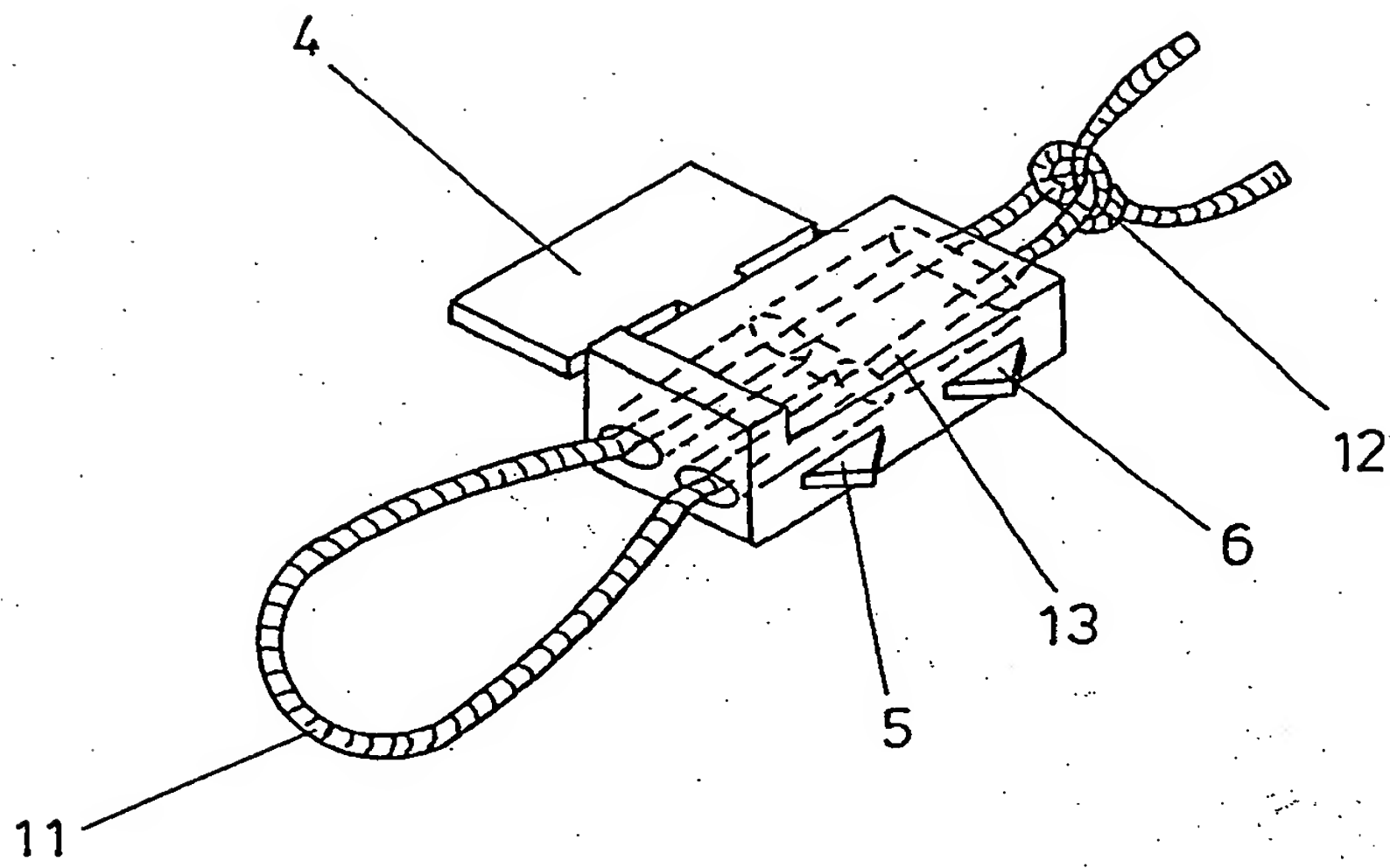


FIG. 2





Improvements in or relating to Security Seals

This invention relates to security seals for providing evidence of tampering.

It is well known to apply a security seal to member used to prevent opening of a container so as to provide evidence of an unauthorised attempt to remove the member in order to gain access to the interior of the container.

Thus, for example, such a seal may be applied to an elongated member which member serves as a draw string to retain the mouth of a sack in a closed condition, or to retain the closure of a container or the like in a closed condition, for the storage or transport of goods. The ends of the elongated member are enclosed by the seal which is then mechanically deformed into engagement with the member by crimping. The member can only be removed from the container to allow access to the contents either by breaking the seal or by cutting the member. In either case, however, it is readily apparent that the container has been tampered with.

It is also known to apply such a security seal to an elongated member retaining a cover on the casing of an electricity meter, gas meter or other measurement instrument in order to indicate if an attempt has been made to interfere with the instrument for, for example, the purpose of avoiding payment for the electricity, gas or other service supplied.

Hitherto, security seals have ordinarily been formed of lead, steel or other suitable metal but it has recently been proposed to form the security seals, from mechanically deformable plastics material. However, it has been found that the use of such materials for the security seal is disadvantageous in that, in certain circumstances, it is possible to apply heat to the seal in such a way as to disengage the seal

from the member and then to re-engage the seal with the member after the container has been opened. Similarly, it is possible to cut the seal to disengage the seal from the member and then to apply heat to the seal in order to re-engage the seal with the member after the container has been opened.

It is an object of the present invention to avoid this disadvantage.

According to the present invention there is provided a security seal for application to a member for preventing opening of a container to provide evidence of tampering when an attempt is made to remove the member and gain access to the container, which security seal includes a body portion formed of plastics material which is deformable into engagement with the member and one or more tamper-indicating portions each of which has dimensions such that it distorts in preference to the body portion when heat is applied in an attempt to disengage the seal from, as to re-engage the seal with, the member.

In a particularly preferred embodiment the member for preventing opening of the container is an elongated member formed of, for example, metal, plastics, fibre or filament material and the body portion of the seal is adapted to receive both ends of the elongated member. The seal is then crimped using a suitable crimping tool so as to deform the seal into mechanical engagement with both ends of the member. If, subsequently, heat is applied to the seal with a view either to releasing one or both ends of the member or, to re-engaging the member after an attempt to cut the seal, at least one tamper-indicating portion will distort (or preferably melt) and thus it will be readily apparent that an attempt has been made to remove the member with a view to gaining access to the container or instrument.

Preferably, the tamper-indicating portion is in the form of a thin web of the plastics material and, advantageously, the web includes a logo or other identification letters or numerals which may similarly
5 be distorted when heat is applied.

In an embodiment, one of the ends of the elongated member has been previously attached to the body portion of the seal, or is formed integrally therewith, so that, in use, it is merely necessary to insert the
10 other of the ends into the body portion and appropriately crimp the body portion so that both ends of the member are secured together by means of the seal.

For a better understanding of the invention and to
15 show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figs. 1a, 1b and 1c are respectively perspective views of security seals in accordance with the present
20 invention,

Fig. 2 is a plan view of the seal of Fig. 1a with one end of an elongated member attached to the seal,

Fig. 3 is a perspective view of a similar seal to that shown in Figs. 1a and 2 but crimped to both ends
25 of another type of elongated member,

Fig. 4 is a perspective view of a similar seal to that shown in Fig. 1b but crimped to an elongated member,

Fig. 5a is a perspective view of a variation of
30 the seal shown in Fig. 1a for use with a knotted or twisted elongated member and Fig. 5b is a perspective view of the seal of Fig. 5a when crimped to the knotted elongated member.

Referring now to Figs. 1a to 1c, the security seal
35 is moulded from polypropylene or other suitable material and includes a body portion 1 provided with a

pair of bores 2 and 3 passing through the body portion from one end to the other. Although rectangular and round seals are illustrated, the seals may be of any suitable shape. In Fig. 1a the seal also includes a first tamper-indicating portion in the form of a thin rectangular-shaped web 4 of polypropylene provided at a first side of the body portion 1. Second and third tamper-indicating portions are provided on a second side of the body portion opposite to web 4 and each of these is in the form of thin triangular-shaped web 5 and 6. In Fig. 1b the tamper-indicating portions are also in the form of thin triangular webs 5,6 and in Fig. 1c the tamper-indicating portion is in the form of a substantially rectangular web 10. It will be appreciated that the seals of Figs. 1b and 1c may equally include a thin rectangular-shaped webs 4 similar to that of Fig. 1a and/or respectively rectangular web 10 or triangular webs 5,6. The number, shape and disposition of the webs 4,5,6,10 are selected in accordance with the size and shape of the body portion 1.

The security seal is intended for use with an elongated member suitably attached to a container to prevent opening of the container. One example of a suitable elongated member is shown in Fig. 2 and denoted by reference numeral 7. This is a moulded plastics wire. Another example of a suitable elongated member is shown in Fig. 3 and is denoted by reference numeral 8. This elongated member is in the form of a lashed metal wire. The wire may, for example, be formed from copper or stainless steel and may be galvanised. A lashed plastics member may also be suitable. A further example of a suitable elongated member is illustrated in Figs. 5a and 5b and is in the form of a string or cord 11.

Ordinarily, as shown in Fig. 2, a first end of the

elongated member will already be secured in one of the bores of the body portion 1 prior to use. In the case, for example, of a metal wire, one end of the wire may initially be secured in a bore by a small deformation of the body portion 1. Alternatively, the body portion 1 may be formed integrally with the elongated member 7 and may thus include only one bore. In use, the elongated member 7 is suitably attached to the container (not shown) so as to prevent it being opened and the second end of the elongated member is then inserted into the vacant bore in the body portion 1. The body portion 1 is then mechanically deformed by means of a suitable crimping tool which, in the embodiment shown in Figs. 3 and 4, causes letters and numbers denoted by reference numeral 9 to be embossed in the surface of the body portion as well as deforming the seal into engagement with both ends of the elongated member so that both ends are firmly engaged within bores 2 and 3.

As shown in Figs. 5a and 5b, if the elongated member 11 includes a knotted or twisted portion 12, this can be accommodated in a cavity 13 in the body portion 1 and, as particularly illustrated in Fig. 5b, is secured therein by crimping so that it cannot be untied or untwisted.

Since the security seal is formed from a thermoplastic plastics material such as polypropylene, it might be thought that it could be softened sufficiently, by the application of heat, to enable the elongated member to be removed from the seal and thereby to gain access to the container. However, since the portions 4, 5 and 6 are very much thinner than the body portion, they will tend to distort and melt when heat is applied to the seal before any significant softening of the body portion 1 will occur. Thus, it will be readily apparent that an attempt has

been made to remove the seal by the application of heat.

Claims:

1. A security seal, for application to a member for preventing opening of a container, to provide evidence of tampering when an attempt is made to remove
5 the member and gain access to the container, which security seal comprises

a body portion formed of plastics material which is deformable into engagement with the member, and
at least one tamper-indicating portion which
10 distorts in preference to the body portion when heat is applied to the seal.

2. A security seal according to claim 1, wherein the at least one tamper-indicating portion has dimensions relative to the body portion being such as
15 to provide preferential distortion of the tamper-indicating portion.

3. A security seal according to claim 1 or claim 2, which is attachable to at least one end of the member by crimping.

20 4. A security seal according to any one of the preceding claims, wherein the at least one tamper-indicating portion is a thin web of plastics material.

5. The security seal according to any one of the preceding claims, wherein the at least one tamper-
25 indicating portion includes a logo or other identification letters or numerals.

6. A security seal according to any one of the preceding claims wherein the member is formed integrally therewith.

30 7. A security seal according to any one of claims 1 to 5 which is attachable to both ends of the member by crimping.

8. A security seal according to any one of the preceding claims wherein the seal is formed of
35 polypropylene.

9. A security seal according to any one of the

preceding claims wherein attachment means, in the form of at least one bore, extending into the body portion, is provided for attachment of the at least one end of the member.

5 10. A security seal according to claim 9 wherein the at least one bore is deformable to attach the at least one end of the member firmly to the seal.

10 11. A security seal according to any one of the preceding claims wherein the at least one tamper-indicating portion is very much thinner than the body portion.

12. A security seal according to any one of the preceding claims in combination with the member and wherein the member is an elongated member.

15 13. A security seal according to claim 12 wherein the elongated member is formed of metal or plastics material or fibre or filament material.

20 14. A security seal accordingly to claim 12 wherein the elongated member is formed of moulded plastics wire or lashed metal wire or lashed plastics wire or string or cord.

15. A security seal according to any one of claims 12 to 14, wherein the elongated member has a knotted or twisted portion.

25 16. A method of preventing opening of a container closed by an elongated member to provide evidence of tampering when an attempt is made to remove the member and gain access to the container, comprising the steps of forming a security seal according to any
30 one of claims 1 to 11, attaching at least one end of the elongated member to the seal by crimping, the elongated member having been arranged to prevent opening of the container, and embossing a logo or other letters or numerals onto the tamper-indicating portion
35 of the seal.

17. A security seal as hereinbefore described substantially in accordance with the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

- 10 -

Application number

GB 9204317.3

Relevant Technical fields

(i) UK CI (Edition L) B6P (PL4A1)

(ii) Int CI (Edition 5) G09F 3/02, 3/03

Search Examiner

M J RICHARDSON

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Date of Search

22 MARCH 1993

Documents considered relevant following a search in respect of claims 1-17

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	US 4506914 - see column 3. lines 16-19, column 5 lines 34-36	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

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